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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/630,915	08/02/2000	Monsieur Bernard Bidet	33396-070337.0205	7905

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EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 10/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

9

Office Action Summary

Application No.

09/630,915

Applicant(s)

BIDET, MONSIEUR BERNARD

Examiner

Justin R Fischer

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama (JP 55-36266, newly cited) in view of Suzuki (US 4,500,672, newly cited). Mayama discloses a pneumatic tire construction having an innermost, air impermeable layer (innerliner), an intermediate reinforcing layer, and an outer carcass layer, in relation to said innerliner and intermediate layer. In describing said intermediate layer, Mayama suggests a composition comprising natural rubber and styrene butadiene rubber (copolymer of one or more conjugated diene polymers and one or more vinyl aromatic polymers). Table 3 clearly discloses a plurality of compositions (A-F) for the intermediate layer having both natural rubber (RSS #3) and styrene butadiene rubber (SBR 1500). The reference further suggests the use of a variety of carbon blacks in the intermediate layer in an amount that is less than 50 phr, including HAF, FEF, and GPF (Table 1). However, Mayama is silent with respect to (a) the properties of the carbon black (BET surface area and DBP oil absorption) and (b) the specific makeup of the styrene butadiene copolymer (i.e. 1,2 bond content in butadiene portion (D) and vinyl aromatic chain content (VA)). Regarding the carbon black, one of ordinary skill in the art at the time of the invention would have recognized the well known carbon black

Art Unit: 1733

fillers of Mayama (HAF, FEF, GPF) as having properties that satisfied the broad quantitative limitation of the claimed invention, as further evidenced by Suzuki (Table 8). With respect to the styrene butadiene copolymer, the four quantitative relationships required by the claimed invention define a plurality of well known SBR copolymers and one of ordinary skill in the art at the time of the invention would have readily appreciated the SBR 1500 of Mayama as meeting the quantitative limitations of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the intermediate layer of Mayama from a rubber composition including carbon black and SBR copolymer in accordance to the limitations of the claimed invention, as set forth below.

Regarding the carbon black makeup required by claim 1, Mayama suggests the use of one of several, well known carbon blacks in an amount less than 50 phr, including HAF (N330), FEF (N550), and GPF. While Mayama fails to include the BET and DBP properties, one of ordinary skill in the art at the time of the invention would have recognized that the quantitative limitation of the claimed invention is satisfied by many of the well known carbon blacks disclosed by Mayama in view of the conventional carbon black properties, as evidenced by Suzuki. In this instance, Suzuki discloses the conventional DBP number for HAF (N330) and FEF (N550), respectively: 101 ml/100 grams and 115 ml/100 grams (Table 2, Examples 7 and 8). To satisfy the quantitative limitations of the claimed invention, then, the BET surface area would have to be less than approximately 101 m²/gram and 85 m²/gram, respectively. One of ordinary skill in the art at the time of the invention would have readily appreciated and expected the

Art Unit: 1733

carbon blacks of Mayama to have the necessary BET surface area values as they define an extremely broad range and include a plurality of values that are ordinarily associated with HAF and FEF. Furthermore, applicant has not provided any unexpected results to establish a criticality for the carbon black of the claimed invention and as such, it would have been obvious to select a carbon black that satisfied the quantitative relationship of the claimed invention in view of Mayama and Suzuki. It should be noted that Table 3 is not evidence of "unexpected results". The composition of Test 8 varies from each of Tests 7, 9, and 10 in that more than one variable is altered (base rubber composition, additive materials and quantities) and as such, there is no conclusive evidence that the realized benefits can be attributed to the specific carbon black.

As per the four quantitative relationships defining the makeup of the copolymer, it should initially be noted that limitations (iii) and (iv), which require a 1, 2 bond content and a vinyl aromatic content greater than 10%, would have been readily appreciated by one of ordinary skill in the art at the time of the invention. They define an extremely broad range between 10 and 100% for each of the respective chain contents that define well-known and extensively used SBR compositions in the tire industry. With respect to limitations (i) and (ii), applicant defines a very broad range to relate the aforementioned bond/chain contents. For example, in taking a conventional value of 20% for VA, the quantitative relationship requires that D is between 25 and 83.2, which defines a large range of conventional values for the 1,2 bond content. Additional conventional values, such as 35% for VA, suggest that D would have to be between 0 and 58, which again

Art Unit: 1733

defines a broad and conventional range for the 1,2 bond content. Thus, it is evident that the quantitative relationships defined by applicant are satisfied by several embodiments in which the bond/chain contents take on conventional values. Furthermore, applicant has not established any criticality in the formation of the aforementioned quantitative relationships that would define over the use of conventional bond/chain content values. In Tables 1 and 3, both SBR A and SBR B satisfy the quantitative limitations of the claimed of invention, and as such, there is nothing of record to clearly evidence the benefits of SBR copolymers that meet the aforementioned limitations as compared to those that don't.

Regarding claim 2, the natural rubber suggested by Mayama (RSS or rib smoked sheet) would have been recognized by one of ordinary skill in the art at the time of the invention as having an extremely high cis 1,4 bond content (90-100 %), and in particular well above 80 %.

With respect to claim 8, Mayama defines a plurality of compositions for the intermediate layer in which the stearic acid component is in an amount of 2.5 phr (Table 3). While the reference fails to expressly provide a range for the stearic acid or describe a specific embodiment in which the stearic acid is less than 2 phr, one of ordinary skill in the art at the time of the invention would have found it obvious to use stearic acid in a variety of amounts in accordance to well known and conventional tire rubber composition manufacture. It is well known that stearic acid defines one of several general additives that are included in tire rubber compositions, wherein said additives are added in a small amount that usually varies on the order of 1-5 phr. As such, using

Art Unit: 1733

stearic acid in an amount between 0 and 2 phr would have been obvious to one of ordinary skill in the art at the time of the invention, there being no evidence of unexpected results due to the stearic acid amount.

As per claim 9, Mayama suggests the use of zinc oxide in an amount of 3 phr in compositions A-F of Table 3, it being further noted that additional amounts within the claimed range would have been within the purview of one of ordinary skill in the art at the time of the invention.

Regarding claim 10, Mayama describes the use of sulfur in an amount of 2 phr in compositions A-F of Table 3, it being further noted that additional amounts within the claimed range would have been within the purview of one of ordinary skill in the art at the time of the invention.

With respect to claim 11, Mayama includes several embodiments in which the thickness of the intermediate layer is varied. In Example 1 of Mayama (Table 4), the intermediate layer has a thickness of 1 millimeter, wherein the rubber composition of this embodiment contains natural rubber and SBR copolymer.

3. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of Materne (US 6,156,822, of record). Mayama and Suzuki are applied in the same manner as set forth in the rejection of claim 1 above. The references, however, fail to suggest the use of additional filler components, such as silica or modified carbon black, wherein surface-active groups (silica or aluminum) are present. In any event, it is extremely well known in the tire industry to include multiple reinforcing fillers in tire rubber compositions and

Art Unit: 1733

furthermore, to modify the surfaces of either individual or multiple filler assemblies with hydroxyl groups. For example, Materne describes a tire rubber composition in which fillers such as carbon black, precipitated silica, and other fillers containing hydroxyl groups on their surface (i.e. aluminum doped precipitated silica and modified carbon blacks) are included. The use of both carbon black and silica allows a given rubber composition to have enhanced reinforcement capabilities since the recognized benefits of each filler can be realized. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to form a reinforcing assembly with (a) carbon black and doped silica (AlOH or SiOH) or (b) modified carbon black with AlOH or SiOH. It should be noted that the use of surface agents is not limited to the tread portion since the increase in reinforcement capability is desired in all rubber tire components, including the intermediate layer of Mayama. Lastly, Mayama specifies that less than 50 phr of carbon black is desired, thus suggesting that the use of an additional, well known reinforcing filler would be in an amount less than 50 phr.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama, Suzuki, and Materne as applied to claim 3 above, and further in view of Nakamura (US 6,333,375, of record). Mayama, Suzuki, and Materne are applied in the same manner as set forth in the rejection of claim 3 above. In this instance, the use of well-known silica having surface-active agents would have been obvious to one of ordinary skill in the art at the time of the invention, as evidenced by Materne. While Materne fails to describe the BET specific surface area, the range of the claimed invention is extremely broad and defines conventional values for silica compounds used in the tire industry, as

Art Unit: 1733

evidenced by Nakamura. In this instance, Nakamura suggests a silica filler having a preferred BET range of 100-250 m²/gram, more preferably 120-190 m²/gram (Column 12, Lines 21-32). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a silica with the claimed BET surface area since the limitations of the claimed invention define well-known silica fillers that provide the necessary reinforcement capability.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of Sturm (US 5,504,159, newly cited). Mayama and Suzuki are applied in the same manner as set forth in the rejection of claim 1 above. In describing the intermediate layer composition, Mayama suggests that a plurality of well-known additives, including processing oils, acceleration agents (1.2 phr), aging prevention agents (1.5-2 phr), stearic acid, and sulfur, can be incorporated into the base rubber composition. While the reference fails to expressly describe the use of p-phenylene diamine (antioxidant/antiozonant), it is well known in the tire industry to include such a compound in rubber compositions to eliminate degradation caused by oxidation, as evidenced by Sturm (Column 1, Lines 10-20). The reference further states that typical amounts of antioxidants/antiozonants are 1-5 phr, which mimics the broad range of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include p-phenylene in an amount between 1 and 5 phr in the intermediate rubber composition of Mayama, in view of well known rubber compounding techniques and further evidenced by Sturm.

Art Unit: 1733

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama and Suzuki as applied to claim 1 above, and further in view of King (US 3,563,928, newly cited). Mayama and Suzuki are applied in the same manner as set forth in the rejection of claim 1 above. In describing the intermediate rubber layer composition, Mayama suggests the use of a plurality of well known additives, including but not limited to sulfur, stearic acid, and processing oils. However, the reference fails to suggest the use of a metal salt (cobalt, nickel, or iron) selected from the group consisting of (a) organic salts or (b) hydroxides in an amount between 0.03 and 3 phr. In any event, metal salts represent a well known additive that is conventionally used in tire rubber compositions to improve the tackiness or adhesion characteristics of a given rubber component, as evidenced by King (Column 2, Lines 10-14 and Lines 30-40). In particular, King discloses the use of an organic salt in the amount of 0.5-10 phr, which incorporates nearly the entire range of the claimed invention. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a metal salt in the intermediate layer of Mayama, in view of King, for the benefits of improved tack. It should lastly be noted that the intermediate layer of Mayama functions as a bonding agent for the innerliner and the carcass and as such, enhanced tack would be especially desirable in the intermediate layer of Mayama (in addition to natural rubber, which also promotes tack).

Response to Arguments

7. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection. The rejection of claims 1-11 with Liu has been withdrawn in view of the newly found art as set forth in the rejection above.

As stated above, Mayama discloses an intermediate layer that bridges the innerliner to the carcass structure in an analogous manner to the claimed invention. In this instance, the intermediate layer of Mayama comprises both natural rubber (RSS #3) and styrene butadiene copolymer (SBR 1500). Also, Mayama disclose the use of several carbon blacks in an amount less than 50 phr, including HAF, FEF, and GPF. Thus, the pertinent arguments are with respect to the quantitative relationships of the carbon black and SBR.

Regarding the carbon black, Suzuki has been used to evidence the conventional DBP absorption numbers that are associated with HAF (N330) and FEF (N550). These values, in turn, suggest a broad range of between 0 and 101 m²/gram and 0 and 85 m²/gram for the BET surface area, respectively. One of ordinary skill in the art at the time of the invention would have readily appreciated the carbon blacks of Mayama as having the necessary BET surface area since the broad range is consistent with BET surface areas that are ordinarily associated with the conventional carbon blacks suggested by Mayama. Furthermore, applicant has failed to provide any unexpected results to establish a criticality for the carbon black of the claimed invention, as defined by the quantitative relationship between the DBP absorption and the BET surface area.

Art Unit: 1733

With respect to the relationships concerning the copolymer (SBR), it is acknowledged that said relationships do not encompass all the conventional styrene butadiene copolymers, as evidenced by applicant on Page 10 of Paper Number 8. However, the broad range defined by said relationships does incorporate many of the conventional styrene butadiene copolymers. Furthermore, Mayama suggests the use of SBR 1500, it being noted that SBR 1500 is recognized as having approximately 24% bound styrene. While the specific chain contents (1,2 in diene part and vinyl aromatic) are not disclosed by Mayama, one of ordinary skill in the art at the time of the invention would have recognized that SBR 1500 and similar SBR copolymers have properties that fall within the ranges defined by the quantitative relationships. Also, applicant has not provided any experimental data that compares the properties obtained when using an SBR copolymer that satisfies the claimed invention and an SBR copolymer that does not satisfy the claimed invention. Thus, in view of the rubber composition disclosed by Mayama and the broad range of the claimed invention, it would have been obvious to one of ordinary skill in the art at the time of the invention to select an SBR copolymer that meets the limitations of the claimed invention. ~

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(703) 605-4397**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers


Art Unit: 1733

for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Justin Fischer

October 9, 2002


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700